Comment No.	EA Document Pag	A Document Sectio	Type
C45	104	10.4.1	C

C46	104	10.4.1	C

C47	104	10.4.1	C

C47 Cont			
C48	104	10.4.1	E
C49	104	10.4.1	E

C50	110	10.4.2.1	E
C52	111	10.4.2.4	E
C52 Cont			

C55	114	10.6.1	E
C55 Cont			

Comment and Requested Modification

Powertech's Comment type key:
A – alternate approach proposed;
C – correct to be consistent with application, regulations or NRC license requirements;
E – additional explanation requested;
I – inconsistency (internally inconsistent between parts of Draft permit or supporting documents);
R – remove; inconsistent with application, regulations or NRC license requirements;
T – typographical error

In the 1st paragraph, the statement is made that "the NRC ... did not use the most recent regulatory-approved version of the [AERMOD and CALPUFF] model software platforms." The AERMOD version used by IML Air Science (IML) in the project modeling was updated by IML's software vendor, Lakes Environmental, multiple times after the original modeling protocol was developed. As a practical matter, any model version is likely to be out of date by the time an EIS is published. This is particularly true when follow-up model runs are required. The important consideration is that the versions of AERMOD and its associated software tools were current and mutually compatible when the model was implemented, and that to preserve comparability the model was not changed mid-stream. Powertech requests updating the discussion to document that the versions of AERMOD and its associated software tools were current and mutually compatible when the model was implemented.

In the 2nd paragraph, the statement is made that "EPA did not find that NCR [sic] provided sufficient information to support the use of dry depletion in the AERMOD analysis." Precedent has been established by state and federal agencies for using the dry depletion option in AERMOD to model short-term impacts from fugitive dust emissions. For example, a coal lease application in Utah triggered PM10 modeling that included a refined analysis using deposition and plume depletion (**IML 2013; Exhibit 033**). Page 9 of Appendix K in the Alton Coal Lease DEIS states, "deposition was only considered for assessing the final PM10 modeled ambient air impacts. Deposition was not considered for any other pollutants …" Page 10 states, "the primary pollutants of concern are fugitive dust." (**BLM 2015; Exhibit 034**).

The Colorado Department of Public Health and Environment (CDPHE) uses dry depletion to model PM10 impacts from fugitive dust sources at mining facilities seeking air quality construction permits (**IML 2013; Exhibit 033**). Recent projects for which this option was used include the Lafarge Gypsum Ranch Pit, Oxbow Mining's Elk Creek Mine, and Bowie Resources' Bowie N.2 Mine. The Wyoming Department of Environmental Quality stated that it would accept the use of plume depletion algorithms in AERMOD as long as an applicant justifies the inputs, including particle size, particle density and mass fraction (**IML 2013; Exhibit 033**). Both Colorado and Wyoming operate EPA-approved air permitting and enforcement programs.

A recent modeling analysis was triggered by high fugitive dust impacts in the Salt River area of Arizona. Maricopa County was reclassified as a serious PM10 nonattainment area on June 10, 1996. The primary sources of particulate pollution in this area are "fugitive dust from construction sites, agricultural fields, unpaved parking lots and roads, disturbed vacant lots and paved roads" (IML 2013; Exhibit 033). Cited among the "general characteristics that make AERMOD suitable for application in the Salt River Study area" is the claim that "gravitational settling and dry deposition are handled well." Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

In the 2nd paragraph, the statement is made that "The dry depletion option may be appropriate to use in AERMOD when sufficient data are available to determine the particle size distribution and other particle information reasonably well for each source." Powertech asserts that sufficient justification was provided in the IML 2013 modeling (Exhibit 033), as summarized below.

The original PM10 particle size distribution was obtained from the modeling protocol for the Rosemont Mine in Arizona (IML 2013; Exhibit 033). The modelers for the Rosemont project acquired this distribution from **AP-42** Section 13.2.4 and applied it to fugitive dust emissions from haul roads. Because Section 13.2.4 applies to aggregate handling and storage piles, other sources were consulted to validate the use of this particle size distribution for haul road dust. A study by Watson, Chow and Pace referenced in a New Jersey Department of Environmental Protection report found that 52.3% of the particulate from road and soil dust is less than 10 µm in diameter. Of this particulate 10.7% was found to be smaller than 2.5 µm in diameter and the remaining 41.6% fell between 10 and 2.5 µm. Assuming that fugitive dust particle sizes follow a lognormal distribution, these two data points were transformed into a multi-point particle size distribution for comparison to the original particle size distribution. The geometric mass mean diameter for the original distribution is 6.47 µm, while the mean diameter for the lognormal distribution is 5.76 µm. EPA's AP-42 Section 13.2.2 and supporting studies characterize PM30 from unpaved road dust (the dominant source at Dewey-Burdock) as 30.6% PM10 and 3.06% PM2.5. Again, assuming a lognormal particle size distribution, the mean diameter would be 6.77 µm. CDPHE has approved a mean coarse particle diameter for road dust of 6.25 µm (Trinity 2016; Exhibit 035). Since these values are clustered around the original PM10 size distribution, it was retained for both CALPUFF and AERMOD dry deposition modeling.

As stated above, the mass mean diameter of PM10 particles with the chosen size distribution referenced above is 6.47 µm, or approximately 65% of the top diameter. Applying this ratio would yield about 1.5 µm for the mean PM2.5 particle size. Hence, the choice of 1 µm mean particle size diameter for PM2.5 was conservative in that it increases atmospheric entrainment and decreases settling. In contrast to PM10 modeling, the plume depletion option had only a minor effect on modeled PM2.5 impacts.

Aluminosilicate clay minerals that characterize soil dust in the project area typically have particle density near 2.65 g/cm3. As indicated in IML's final report (IML 2013; Exhibit 033), the Environmental Science Division of Argonne National Lab states, "A typical value of 2.65 g/cm3 has been suggested to characterize the soil particle density of a general mineral soil. Aluminosilicate clay minerals have particle density variations in the same range." Another study of fugitive dust from unpaved road surfaces, by Watson and Chow, also cites 2.65 g/cm3 for soil particle density (IML 2013; Exhibit 033). In a more recent analysis, the CDPHE-approved particle density for road dust is 2.655 g/cm3 (Trinity 2016; Exhibit 035). Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

In the 2nd paragraph, the statement is made that "dry depletion should have been applied to all receptors within the model domain." Using the dry depletion option, IML modeled all receptors with predicted 24-hour PM10 impacts in the initial modeling run that, when added to background, were greater than the NAAQS of 150 µg/m3. This threshold was chosen to demonstrate ultimate compliance of all initially high receptors. The regulatory default settings were used to screen potential problem receptors, and the dry depletion option was used to refine the model results only for those receptors. Since the dry depletion option has the effect of reducing (never increasing) predicted impacts, it was deemed unnecessary to apply this option to receptors already demonstrated to be below the NAAQS threshold. The predicted concentrations would only have decreased beyond those obtained under the regulatory default option. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

In the 3rd paragraph, the statement is made that "the approach used by NRC will not account for the diesel engine exhaust PM10 particles that will not settle out as quickly as the mechanically generated fugitive dust emissions." Most of the non-fugitive sources of particulate emissions at Dewey-Burdock are diesel engines. EPA is correct that some error may be introduced by including combustion sources of PM10 in the dry depletion runs. Most particulate matter in diesel exhaust falls within the PM2.5 category and exhibits a much slower deposition rate than PM10. Nonetheless, fugitive sources are dominant at Dewey-Burdock, where diesel exhaust constitutes only 1% of the total PM10 emissions. For this reason, and to avoid further complicating the final model run, IML grouped all PM10 sources together. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

With regard to the 24-hour PM10 modeling results, the statement is made in the 1st paragraph that "the top 3 values are of interest regardless of when they occurred." For compliance demonstration, the standard design value is the 4th high concentration over a 3-year period. This value is shown in Table 6-1 (**IML 2013; Exhibit 033**) and should not be confused with the yearly statistics also presented in that table. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

In the 1st paragraph in this section, the statement is made that "IML and NRC determined there is evidence and precedent that supports excluding ground-level, fugitive PM10 emissions from the assessment of project impacts on visibility at Wind Cave ... However, EPA did not support this approach for the SEIS." As stated in the final report (**IML 2013; Exhibit 033**) and acknowledged by EPA, even without excluding coarse particulates, the 98th percentile of the annual 24-hour average changes in haze index is less than the contribution threshold of 0.5 dv. Still, IML conducted a final model run excluding coarse PM10 for several reasons:

CALPUFF predicted that 70% of visibility impairment at Wind Cave from the Dewey-Burdock Project was caused by coarse PM10. This goes against visibility modeling results obtained by various agencies including South Dakota DENR. Aerosols of sulfate and nitrate, organic carbon, and fine particulates (PM2.5) are generally the significant contributors to visibility impairment.

To test the reasonableness of the modeled impact of coarse particulates on visibility at Wind Cave, IML used CALPUFF to model the impact of PM10 coarse emissions from Dewey-Burdock at three test receptors (**IML 2013; Exhibit 033**). The receptors were placed 40, 80, and 116 km from the project, respectively. CALPUFF predicted higher relative contribution from coarse PM10 as the distance from the project to the receptor increased. This outcome defies common sense and exposes the fallacy of modeling visibility without accounting for near-field deposition of coarse PM10.

Notwithstanding EPA's challenge to the evidence and precedent appearing in the final report, the modeling protocol does cite NEPA precedent for excluding fugitive dust emissions from visibility impact modeling. This approach was followed in the Atlantic Rim EIS (**IML 2013; Exhibit 033**), which cited supporting documentation from the Western Regional Air Partnership (WRAP).

A 2005 study (**VISTAS 2005; Exhibit 036 at p. 3-13**) states, "PM2.5 particles, which have a mass median diameter around 0.5 µm, have an average net deposition velocity of about 1 cm/minute ... On the other hand, coarse particles ... have an average deposition velocity of about 1 m/minute, which is significant, even for emissions from elevated stacks." It seems unreasonable to model the long-range transport of both species as if they behaved the same.

Regarding exclusion of coarse particulates from stationary sources: It should be noted that stationary sources at Dewey-Burdock are combustion sources with negligible emissions compared to mobile sources and fugitive dust sources. Moreover, particulates from stationary combustion sources are 97% PM2.5 (**IML 2013; Exhibit 033**) and were already accounted for since only coarse PM10 was omitted from the final visibility model run. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

In the 2nd paragraph in this section, the statement is made that "the Dewey-Burdock project has not been shown to greatly effect [sic] regional cumulative air quality." This should be expected, given the comparison between project emission levels and regional emissions. Since fugitive PM10 emissions from Dewey-Burdock constitute the largest single pollutant, and since EPA's analysis takes issue with the degree of conservatism in modeling fugitive PM10 impacts on air quality and visibility, the following table (from **Exhibit 037** EPA NEI Emissions Data 2014 WY SD) may lend some perspective:

Area Encompassed	Fugitive Emission Sector(s)	PM_{10} Emissions (tons/year)
State of Wyoming	Unpaved Road Dust	421,044
State of Wyoming	Mining Dust	93,331
State of Wyoming	Crops and Livestock Dust	39,112
State of South Dakota	Crops and Livestock Dust	333,119
State of South Dakota	Unpaved Road Dust	77,273
Dewey-Burdock Permit Area and County Road	All Fugitive Dust Sources (max. year)	458

Source: EPA 2017; Exhibit 037

Since Wyoming is situated generally upwind from Wind Cave National Park, fugitive dust from this state may be more relevant than dust from South Dakota. Projected maximum fugitive PM10 emissions from Dewey-Burdock represent 0.08% of the emissions from Wyoming's three largest sectors, and 0.11% of the emissions from South Dakota's two largest sectors. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

EPA Response

found 2:
Watson et al., 1991 J.G. Watson, J.C. Chow, T.G. Pace Chemical mass balance P.K. Hopke (Ed.), Receptor Modeling for Air Quality Management, Elsevier Press, New York, NY (1991), pp. 83-116

J.G. Watson, J.C. Chow, T.G. Pace Fugitive dust emissions W.T. Davis (Ed.), Air Pollution Engineering Manual, Van Nostrand Reinhold, New York, NY (2000), pp. 117-134

probably second one; downloaded reference